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ABSTRACT

This report reviews the status and use of the Time-shared Interactive Computer-Controlled Television (TICCIT), a computer-assisted instructional tool, at Northern Virginia Community College. During 1977-78, 100 terminals were available for student use and 20 for course development and faculty use. Courses available on TICCIT were Algebra I and II and English grammar. Other modules developed for TICCIT and undergoing experimental use were a biology unit test, and units in chemistry literacy, Spanish vocabulary, and fire science. During 1977-78, 397 students enrolled in the English course and 767 in algebra. The system was also used in an adjunctive manner by students who studied individual modules on TICCIT, usually at the suggestion of their instructors. A follow-up survey was done comparing students enrolled in the TICCIT math sections with those enrolled in lecture sections; motivation in choosing either format, completion rate, future math course plans, and career goals were studied. Another survey viewed those enrolled in the TICCIT English classes in terms of who took the class and why, completion rate, re-enrollment, attitudes toward computer-assisted instruction, and measures of achievement. Plans for future course development, and TICCIT system management and operation are outlined. (MB)

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STATUS REPORT ON TICCIT* - 1977-1978

(*Time-shared Interactive Computer-Controlled Television)

Edited by Gloria Terwilliger-Brown

TICCIT Instructional Development Team
- M. Bodnar
- J. Cook
- D. Hayden
- E. Huff
- M. Liu
- B. Marx
- B. Wyles, Chairman

TICCIT Review Committee
- J. Cicero
- E. Niner
- M. Flynn Sasscer
- J. C. Sasscer
- G. Terwilliger-Brown
- J. Netherton, Chairman

TICCIT Staff (Instructional Support)
- J. Beaudry
- K. Burke
- T. Rodgers
- L. Schwarz

TICCIT Staff (Operational Support)
- H. Bromley
- E. Cole
- D. Elsen
- H. Keister

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INTRODUCTION

The year has been notable for increased coordination of faculty and staff in TICCIT course development and administration, and for the awarding of the National Science Foundation CAUSE and Local Assessment grants. The latter is an event; the former is a pervasiveness, which is considered to be a major contributory factor in the writing and awarding of the grants. These grants give needed support and impetus to the development of adjunctive uses of TICCIT.

TICCIT at Alexandria is a campus resource. The student terminals are located in a highly visible and open-access area of the Learning Resource Center; the operation is staffed by Learning Laboratory personnel. Computer-assisted instruction is no longer a novelty or an experiment at the campus. Students in increasing numbers are demonstrating an ease and familiarity with the system.

Some young pre-college students have been introduced to the TICCIT terminals, and have explored the various offerings with ease, delight, and concentration. Some students, having completed basic Math or English requirements on the system, return to refresh and review. There is an air of purpose, of interest, and of expansion.

Learning Lab instructional assistants have increased their skills during the year, developing personal strengths in data entry, instructional design, and authoring support. Technical support staff have added new strategies and techniques, including the ability to develop operating programs for the system.

New course management techniques have been designed by faculty. Interaction among student, instructor, and proctor has increased. There is a greater

awareness of the capabilities of CAI, specifically of TICCIT. In summary, it might be said that TICCIT is no longer dictating terms of use. As the faculty and staff have become more conversant with TICCIT as an instructional resource, they have become more directive and are guiding the system.

1977-78 UPDATE ON TICCIT USE AND DEVELOPMENT

Number of terminals available

100 terminals for student use
20 terminals in faculty areas, including those used by TICCIT courseware authors and technicians.

Location and availability of TICCIT

Student terminals are located in a highly visible and open-access area of the Learning Resource Center and staffed by Learning Laboratory personnel.

Hours of operation = 59.5 hours/week

Monday-Thursday	8:00am - 3:30pm
	6:00pm - 10:00 pm
Friday	8:00am - 5:30pm
Saturday	9:00am - 12:00pm

Number of users registered on System, compared with previous years

Fall 1977 - 879
Fall 1976 - 657
Fall 1975 - 308
Fall 1974 - 52

Courses taught on TICCIT (mainline instruction)

Math 06 - Algebra I
Math 07 - Algebra II
Engl 110 - English Grammar

Modules developed for TICCIT and undergoing experimental use

Biology Unit Test
Chemistry Literacy Unit
Spanish Vocabulary Unit
Fire Science Unit

Number of faculty involved in use and development of TICCIT

17 Faculty members teaching on TICCIT
9 Faculty members prescribing adjunctive use of TICCIT
6 Faculty members serving as courseware authors

NVCC funding support of TICCIT

Operations	1976-77	1977-78
Maintenance contract	$50,000	$53,000
Salaries of staff (includes operations and proctors)	46,000	48,000
Supplies	3,000	3,000
Equipment (Disk Drive)	-0-	11,000
Development		
Training course for authors - 8 faculty and staff	16,000	-0-
Salaries for faculty and staff released for authoring and NVCC in-house evaluation	54,000	26,600 *

Projected courseware development (not in order of priority)

- Development of a module on the use of the metric system
- Development of atomic structure module for Chemistry 101 and Chemistry 111
- Development of genetics modules for Introductory Biology and Genetics courses
- Development of genetics practice problems
- Development of biochemistry module
- Development of calculus practice problems
- Application in other subject areas of the biology testing model, for example, in physics and chemistry
- Development of OSHA standards course module
- Development of module on research paper documentation and form applicable to all subjects
- Development of a query/response system tie-in to campus cable TV system (Phase II)

* figured at $200. per quarter hour (cost of lecturers to replace regular faculty)

While a great deal of interest has been demonstrated by the faculty and the students in expanding the course offerings on TICCIT, two major limitations pre-

vented the realization of this interest. One limitation was the system's capacity; TICCIT's storage space had become saturated and was not relieved until the installation of a new disc drive in April, 1978. The second limitation has been the lack of adequate funding for courseware development. The NSF grants awarded in late Spring 1978 will help to alleviate this problem during the next three years.

TICCIT represents a significant investment by the National Science Foundation, as well as a proportionately significant investment by Northern Virginia Community College. The College, by agreeing to participate in the demonstration, has acquired a highly sophisticated CAI delivery system. Moreover, the College has, through its continued funding, developed an increasingly large cadre of faculty and staff with CAI awareness and skills, both in developing course materials and in utilizing the system for instruction.

TICCIT, as a major system for delivery of computer-assisted instruction, is still relatively new. Experience on the part of faculty and support staff is critical to the success of any CAI project, a fact which has been stressed by Dr. Vic Bunderson, a national expert in computer-assisted instruction. Conrad Katzenmeier, of the National Science Foundation, has stated publicly that the somewhat negative ETS evaluations of both TICCIT and PLATO were conducted before either system was ready to be subjected to summative evaluation. (see April 17 memorandum, Appendix A.) For example, negative student reactions were reported by the ETS evaluation team during the demonstration period. These findings have been contradicted by evaluations made during 1976-77 and 1977-78,

at the Alexandria Campus CAI site, where student attitudes are increasingly positive.

During the past year, questions about the TICCIT system have continued to be raised, data have been gathered and analysis and assessment have been an on-going process. We are seeking to study the effect of computers used as an instructional delivery system. The experience being gained in developing course materials, in offering instruction, and in discovering auxiliary uses for the system is, therefore, recorded in this year's Status Report on TICCIT. Staff members involved in the system operation, use, and assessment are confident that our experiences can be of benefit to the developing body of knowledge about computer-assisted instruction used on a large scale basis.

TICCIT SYSTEM USE

SCHEDULED COURSES

Two instructional divisions were the primary users of the TICCIT system during the 1977-78 academic year. The Humanities Division offered multiple sections of ENGL 110, a grammar course including parts of speech, syntax, punctuation, capitalization, and sentence structure. The Natural Sciences and Math Division offered multiple sections of Math 06-07, a developmental course in Algebra I and II. Seventeen faculty members, twelve full-time and five lecturers, were involved in using TICCIT to teach the various sections. The sections, with enrollment and instructor, are displayed in Tables 1 and 2.

TABLE 1

TICCIT English Courses, 1977-78*

Quarter	Course/Section	Enrollment	Instructor
Summer 1977	110-61	12	Bryan (Jon)
	110-62	15	+Bryan (Judy)
Fall 1977	110-01	19	Bryan (Jon)
	110-02	15	Marx
	110-04	12	+Bryan (Judy)
	110-05	26	Marx
	110-06	28	Liu
Winter 1978	110-01	29	Bryan (Jon)
	110-02	20	Payne
	110-03	19	+Bryan (Judy)
	110-04	16	Payne
	110-05	18	Marx
	110-06	23	Payne
	110-07	26	Marx
Spring 1978	110-01	23	Payne
	110-02	24	Bryan (Jon)
	110-04	24	Marx
	110-05	23	Marx
	110-06	25	+Bryan (Judy)
	Total	397	

+ Lecturer

*Source: Humanities Division

TABLE 2

TICCIT Math Courses, 1977-78

Quarter	Course/Section	Enrollment	Faculty Name
Summer 1977	006-02	19	Bodnar *
	007-02	9	
	006-04	9	Scott
	007-04	8	
	006-06	14	Bodnar
	007-06	16	
	006-08	11	Davis
	007-08	15	
Fall 1977	006-02	19	Bodnar
	007-02	11	
	006-04	16	Scott
	007-04	9	
	006-06	17	Huff
	007-06	4	
	006-08	23	Bodnar
	007-08	4	
	006-10	26	Brumble
	007-10	1	
	006-14	15	+ Neely
	007-14	9	
	006-16	20	+ Peek
	007-16	11	
	006-20	20	+ Perkins
	007-20	7	
Winter 1978	006-02	18	+ Perkins
	007-02	10	
	006-04	25	Scott
	007-04	7	
	006-06	21	Huff
	007-06	10	

* TICCIT Math 06/07 are taught concurrently by one instructor.
\+ Lecturer

NOTE: Table continued on next page

TABLE 2

TICCIT Math Courses, 1977-78

Quarter	Course/Section	Enrollment	Faculty Name
Winter 1978 (continued)	006-08	17	Brumble *
	007-08	5	
	006-10	23	Hayden
	007-10	13	
	006-16	21	+ Peek
	007-16	16	
	006-18	26	+ Neely
	007-18	11	
Spring 1978	006-02	13	Coleman
	007-02	13	
	006-04	20	+ Perkins
	007-04	12	
	006-06	25	Bodnar
	007-06	11	
	006-08	17	Huff
	007-08	14	
	006-10	16	+ Hoffman
	007-10	14	
	006-12	29	Scott
	007-12	11	
	006-14	24	Wilkin
	007-14	12	
Totals	006	504	Students
	007	263	Students

* TICCIT Math 06/07 are taught concurrently by one instructor.
\+ Lecturer

Source: Natural Sciences and Math Division

ADJUNCTIVE USE

Adjunctive use is defined as use of the system by students who study individual modules on TICCIT, usually at the suggestion of their instructors, including students who are completing course requirements for an I grade. Since these students are already enrolled at the College, they are not required to register formally for adjunctive use on TICCIT, and do not receive discrete credit for TICCIT instruction.

A system for formalizing adjunctive use of TICCIT English has been developed. Students are referred by their instructors, usually for remedial work in grammar. An Adjunctive Student Form (see Appendix B) is completed by the faculty member. The form requires a specific assignment to a unit, lesson and/or segment. The faculty member is given a weekly progress report, and at the end of the quarter is advised of the student's progress.

A constantly increasing number of students and faculty with CAI awareness is being developed as a result of the continued use of TICCIT in developmental Math and in ENGL 110. It is reasonable to expect increased adjunctive use in the future. One of the long-range goals expressed by a member of the Math authoring team, Dr. Hayden, is revision of the math units not used in 06 and 07 for adjunctive use in other courses; higher level math, business, social science, physical science, and philosophy.

Therefore it is recommended that a comprehensive system for tracking the adjunctive use of TICCIT be developed and monitored throughout the 1978-79 academic year.

ADJUNCTIVE USE: BIOLOGY TESTING PROJECT

During the academic year 1976-77, an ad hoc committee studied the possibility of implementing computer-managed testing on the Alexandria campus. Various computer supports available to the campus were explored, and it was concluded that the TICCIT system, despite noted constraints, would be suitable for large scale computer-managed testing using forced choice test items.

In Spring 1977 an instructional development project was approved, its goal being to design the introductory Biology course as a pilot upon which to develop a model for computer-managed testing. In Winter 1978 one unit of Biology 101, a chemistry examination, was pilot-tested using the TICCIT system. Two hundred and seventy-eight students were processed through the tests for a total of 417 hours on the system. The project was structured and managed by Science faculty and Learning Lab staff members. The entire instructional development project has been monitored by a separate Instructional Development Review Committee, the members of which have judged the degree of progress and quality of the work sufficient to justify continuation of the project. (See Appendix C for the June 5, 1978 Committee Report)

At this juncture, the project is fifty percent complete, and is programmed for completion of testing, evaluation, and revision by the end of Spring term, 1979. (See Figure 1.) At that time there will be tests for twelve units of instruction, covering the full year of introductory biology, with approximately 3,000 test items stored on magnetic tape. The questions are divided into learning objectives and learning hierarchies, and can be recombined and restructured as required. The system provides for instant grading.

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DEMONSTRATIONS, TOURS, BRIEFINGS, ETC.

References to TICCIT at Alexandria Campus continue to proliferate in the CAI literature. As a result, there has been a constant flow of inquiries about the system, resulting in tours, briefings, and orientations for local, national, and international visitors. Every effort has been made to satisfy these requests, consonant with staff availability. The contacts vary from a brief overview as part of a campus tour to extensive hands-on demonstrations.

Demonstrations and orientations, despite the amount of staff time involved, are considered to be part of our responsibility to the educational community. Accurate figures on the number of visitors and the extent of the briefings and orientations have not been retained in a manner which can be adequately reported.

The system for demonstrations has been reviewed, and a technique for individualizing TICCIT demonstrations using the self-instructional capabilities of the system has been developed. A method for accurately reporting the number of visitors and staff time involved was instituted beginning Summer Quarter, 1978.

COURSE EVALUATION

Math 006/007
English 110

MATH 006/007

Assessment of TICCIT Math classes was based on the following questions:

1. Why do students take developmental math?
2. What factors are involved in student selection of a TICCIT or lecture section?
3. What is the completion rate in TICCIT math classes?
4. Why do students drop TICCIT classes?

Responses to each of these questions are shown on the following pages. Additional information is contained in the Appendix.

One question for which insufficient data is currently available may merit some systematic data collection in the future. The question is:

Is there a measurable difference in performance between TICCIT section students and Lecture section students as they continue the study of Mathematics?

It is recommended by the TICCIT Review Committee that a procedure be developed to collect data to answer this question.

1. Why do students take developmental math?

A simple questionnaire was administered to Math 006/007 students in both TICCIT and lecture sections during the Winter and Spring Quarters.* Four questions were asked:

1. Why are you taking this course?
2. Why did you enroll in TICCIT/lecture format?
3. What are your career goals?
4. What future math course will you take next quarter, if any?

Of the 115 students who responded to the Questionnaire, 67 indicated that they planned to continue the study of Math at NVCC. The future courses they specified are shown below:

CONTINUE DEVELOPMENTAL	33
MATH 118	2
MATH 121	3
MATH 161	17
MATH 181	5
MATH 191	2
BUAD 121	1
BUAD 251	4
	67

Seventeen respondents did not specify a particular course, but indicated a program area of interest which requires Math, or stated that more Math would be necessary. The areas are shown below:

BUAD	3
DAPR	2
ENGR	4
OTHER	6
	17

*Data collected by S. Coleman and analyzed by G. Terwilliger Brown

Four respondents took the NVCC Math courses as prerequisites for transfer to George Mason University. Four took the Math courses in preparation for admission to the NVCC Nursing program.

Sixteen respondents indicated that no further math was planned, or specified a career goal for which math is not necessarily a requirement. (One respondent was taking the math "for pleasure" only.)

Seven respondents were uncertain as to career goals and future math plans.

2. What factors are involved in student selection of a TICCIT or a lecture section?

Most of the 115 respondents expressed definite preferences for the instructional mode in which they were currently placed. Of 53 respondents in TICCIT sections, 34 were positive in their preference for the self-pacing characteristic of TICCIT. On the other hand, of 59 respondents in lecture sections, 48 were emphatic in preferring the classroom and/or having a human instructor to "machines".

Not included in the tabulation are responses from 3 respondents who had had both TICCIT and classroom lecture experiences. One, in a TICCIT class, indicated that the next math experience would be lecture; two in lecture sections who had been on TICCIT before, expressed a preference for lecture format.

The breakout follows:

TABLE 3
Factors Involved in Selection of TICCIT Sections

Prefer Programmed Instruction (no reason)	Prefer CAI for Self-pacing Characteristic	Only time available	Placed by Counselor at NVCC	N=53 Response Not Clear
4	34	11	1	3

TABLE 4
Factors Involved in Selection of Lecture Sections

Prefer Lecture (no reason) or like classroom	Prefer "live" teaching	Only time available	Placed by Counselor (at GMU)	N=59 Response Not Clear
20	28	2	1	8

2. What factors are involved in student selection of a TICCIT or a lecture section? (continued)

A number of students in lecture sections commented that their selection of that instructional mode was influenced by a need for a "live teacher". Some specitic statements are: "In lecture, teacher is present to answer any questions"; "...interaction with instructor is important"; "lecture offers an opportunity to ask questions".

These comments lead to speculation as to whether or not the students who selected lecture classes over CAI are aware of the instructor-student interaction built into TICCIT teaching. It is recommended that, as part of the advisement process, students be made aware of the instructor interaction in TICCIT classes, and also of the constant instructional assistant (proctor) support.

It is further recommended that the simple four-question opinionnaire be repeated in 1978-79 in a modified format for clarity and ease in tabulation, as well as to elicit more specific information.

Modifications suggested include:

1) Offer a choice of future math classes by course designation (i.e., MATH 151 Business Math; MATH 161 College Math; BUAD 251 Business Statistics, etc.)
2) Inquire about previous math experience, i.e., Have you taken Math on TICCIT or in another computer format before? Have you taken Math in lecture format at NVCC before?
3) Ask how student was placed in 006/007. (By placement test? Other? Recommended by a friend?)

2. What factors are involved in student selection of a TICCIT or a lecture section? (continued)

3

4) After determining if student is in TICCIT or lecture, ask how selection was made. Some of the choices could be:

TICCIT	LECTURE
Counselor advised	Counselor advised
Friend recommended	Friend recommended instructor
Had it before and liked format	Had instructor before and like him/her
Prefer self-pacing	Don't think I would like "machine" format
Only time available	Don't like machines at all
	Only time available

Enrollment

In the analysis of TICCIT Math 006 and 007 sections of the 1977-78 academic year several factors were noted. The first was that the enrollment for TICCIT Math 006 classes remained relatively constant while the TICCIT Math 007 enrollment increased. It appeared that students self-selected TICCIT Math over Lecture Math. The TICCIT 006 enrollment was almost twice that of lecture 006 and total TICCIT enrollment was 160% of lecture enrollment. TICCIT Math 006 enrollment remained at approximately 140. Lecture 006 declined gradually from Fall to Winter and declined dramatically from Winter to Spring. (See Table 5)

Math 007 did not have the total enrollment of Math 006. TICCIT 007 enrollment was approximately 38% of TICCIT 006; Lecture 007 enrollment was approximately 59% of Lecture 006. The total enrollment of 007 was approximately 46% of 006. TICCIT 007 enrollment increased from Fall to Spring and averaged 53. Lecture 007 increased from Fall to Winter and then decreased Spring Quarter. (See Table 6)

The decline in 007 enrollment may be considered for study next year. It might be approached from the standpoint that students may be taking 006 for reasons other than as a prerequisite for 007.

TABLE 5
Total Number of Students Enrolled in Math 006
1977-1978

	TICCIT	Lecture
FALL	145	108
WINTER	135	90
SPRING	142	28
TOTAL	422	226

TABLE 6
Total Number of Students Enrolled In Math 007
1977-1978

	TICCIT	Lecture
FALL	33	47
WINTER	58	54
SPRING	70	33
TOTAL	161	134

Completion Rates

The analysis of completion rates over time show significant increases for TICCIT sections. Tables 7, 8, and 9 show this progression. When compared at the end of each quarter, the completion rate of TICCIT Math 006 was less than Lecture Math 006 for the same period. The completion rate for the year was 31% for TICCIT and 47% for lecture.

TABLE 7
Completion Rate ('S' grade) by Quarters, 1977-78 (Math 006)*

	TICCIT		Lecture	
	Per Cent	No.	Per Cent	No.
FALL	31	(45)	44.4	(48)
WINTER	31.9	(43)	45.6	(41)
SPRING	28.9	(41)	57.1	(16)
TOTAL	30.6	(129)	46.5	(105)

* Does not include re-enrolls. See Table 8

However, one of the attributes of TICCIT is that it allows a student to proceed at his own rate, a rate that may not correspond to the arbitrary quarter measure of time. The completion rate for TICCIT, therefore, is expected to increase as the time period allotted students to work is allowed to lengthen.

Table 8 shows that the actual completion rate for students who enrolled in TICCIT 006 in the Fall increased as these students were followed through the succeeding quarters. At the end of the second quarter the completion rate of students who had started in the Fall had increased from 31% to 42.1%. By the end of the third quarter the completion rate had increased to 48.3%.

TABLE 8
Completion Rate ('S' grade) of Fall Population
Tracked through Winter and Spring (Math 006)

	TICCIT		Lecture	
	Per Cent	No.	Per Cent	No.
FALL	31	(45)	44.4	(48)
WINTER	42.1	(61)		
SPRING	48.3	(70)		

Therefore, at the end of the second quarter TICCIT 006 completion rate was almost equal to Lecture 006. By the end of the third quarter TICCIT 006 completion rate had surpassed that of Lecture 006.

The Winter population was followed through Spring Quarter. TICCIT 006 completion rate at the end of the second quarter was approximately the same as Lecture 006 completion rate at the end of Winter Quarter. (See Table 9).

TABLE 9
Completion Rate ('S' Grade) of Winter Population Tracked through Spring

	TICCIT		Lecture	
	Per Cent	No.	Per Cent	No.
WINTER	31.9	(43)	45.6	(41)
SPRING	45.9	(62)		

It is apparent that some students need more time than is provided in one quarter. TICCIT is providing the opportunity for those students to complete Math 006.

A comparison of withdrawal rates shows that withdrawals from TICCIT were fewer than from Lecture. Fall withdrawal rate for Lecture was 22.2%. The highest withdrawal rate for TICCIT was reached after the third quarter when the rate was 14.5%.

The Lecture 007 withdrawal rate averaged 15.7 for the year, while the TICCIT 007 withdrawal rate averaged 11.8% for the year.

From the data it is evident that for any given quarter, the "R" grade will be greater for that quarter's TICCIT population than any other grade. TICCIT also appeared to "retain" its students: TICCIT's withdrawal rate was less and its completion rate was not static. TICCIT's completion rate after three quarters surpassed that of Lecture classes. Since TICCIT courses allow for continuous registration which does not fit the standard quarters, the use of the "R" grade

also facilitates late entry of students during the quarter. It is therefore recommended that the late-entering population (beyond cut-off date for late registration) be identified and studied as a sub-group to ascertain completion rates.

Grade distribution tables for each quarter for both Lecture and TICCIT, for Fall population tracked for two additional quarters, and for the Winter population tracked for one additional quarter may be found in Appendix H.

Source: K. Burke

4. Why do students drop TICCIT Math classes?

W grades were analyzed for students in TICCIT Math 006 and 007 during the Spring Quarter. The analysis is shown in the tables below:

TABLE 10
Analysis of W Grades, Spring 1978
TICCIT MATH 006

Total Enrollment 142
Total No. of W's 29

Percent	Number	Reason
19.3	5	1. Never appeared
51.6	15	2. Multiple absences
0	0	3. Could not handle the class
12.9	3	4. Personal problems--dropped this class only
6.5	2	5. Personal problems--dropped out of school altogether
0	0	6. Other
9.7	4	7. Unknown
100	29	

TABLE 11
Analysis of W Grades, Spring 1978
TICCIT MATH 007

Total Enrollment 70
Total No. of W's 25

Percent	Number	Reason
18.2	4	1. Never appeared
36.4	8	2. Multiple absences
9.1	2	3. Could not handle the class
0	0	4. Personal problems--dropped this class only
0	0	5. Personal problems--dropped out of school altogether
0	0	6. Other
4.5	1	7. Unknown
31.8	10	8. Course adjust into TICCIT 006
100	25	

4. Why do students drop TICCIT Math classes? (continued)

The pattern of reasons does not appear to differ appreciably from normal W's. Further, since such data is extremely difficult to capture with accuracy, it is not recommended that this analysis be repeated.

ENGLISH 110

The ENGL 110 course has undergone a detailed study by the faculty. Course instructors and TICCIT proctors worked formally as a Committee, chaired by Dr. Jonathan Bryan, in observing, monitoring, analyzing, and assessing the various aspects of the course itself, of student reaction, and of faculty attitudes.

According to the Report, the English 110 course has emerged as "a worthy study of grammar as a discipline in its own right, a needed addition to the general education curriculum, and an important resource in the community for citizens with diverse requirements for studying grammar." The Committee feels that TICCIT "offers a valuable alternative to classroom instruction in groups, . . .(and further) offers an intrinsically dry subject in a lively and attractive style." The full text of the Committee Report and the English 110 Syllabus may be found in Appendix D and E.

The Committee has recommended that ENGL 110 continue to serve as an independent college-level elective.

Assessment of the English 110 TICCIT classes was directed by the TICCIT Review Committee and was based on the following questions:

1. Who takes ENGL 110?
2. Why do students take ENGL 110?
3. What is the completion rate in ENGL 110?
4. How many students who received R's did re-enroll and subsequently complete the work?
5. How do students feel about English, computer-assisted instruction, and specifically, about ENGL 110?
6. Is there a measurable achievement gain from the study of ENGL 110?

Responses to each question are shown in the subsequent section. Additional information is included in the Appendix.

ENGLISH 110

1. Who takes 110?

Student records were traced to determine a) what English course(s) had been completed prior to enrollment in ENGL 110, b) what English course(s) were taken concurrently with ENGL 110, and c) what English course(s) were taken the quarter after taking ENGL 110.

The following observations, drawn from the 406 records which were traced,* represent some generalizations yielded by analysis of the data:

Of the 406 student records traced for ENGL 110 during the 1977-78 academic year (Fall, Winter, Spring):

1. 175 took no other English course while enrolled in English 110.
2. 63 students enrolled concurrently in a VSL/ESL course.
3. 61 students enrolled concurrently in either English 111, 112, or 113.

The remaining students were enrolled concurrently in other English prefix courses, i.e., Reading, Literature, Technical Writing, etc.

The supporting data is included in Appendix F.

No definite patterns are discernible from the data collected. English 110 appears to meet the needs of many different kinds of students, from those enrolled in developmental programs to those who have completed the freshman composition series. It is recommended that this study not be repeated.

*Data drawn from enrollment figures reflected in third TICCIT Weekly Report.

2. Why do students take English 110?

An Opinionnaire was distributed each quarter to students in English 110. The Opinionnaires were studied by the English 110 faculty, and results were used to develop the report by the English 110 Committee.

In the Spring Quarter 1978, TICCIT ENGL 110 students were asked to write a paragraph stating their reason(s) for taking ENGL 110, specifically, what they hoped to learn, and how taking the course would assist them in accomplishing their educational/occupational goals. The English 110 Committee was interested in the responses such a query would elicit, and the members of the committee were also interested in the writing samples from their students which these responses would provide.

An overwhelming number of students indicated that they were taking 110 in order to improve their communication skills, both oral and written. Many students, particularly those for whom English is a second language, hoped to improve their reading skills. Of those students who were employed, many wrote that they needed to upgrade their communication skills to advance professionally and thought the course would be beneficial. Several students stated that they were taking the course as a preparation for the college transfer English composition series; others were enrolled concurrently in English composition and were taking 110 on the advice of their previous or current instructor, as an opportunity for additional drill and practice in grammar. A few students were interrupting their series of English composition courses to take 110 before proceeding. A great many students wrote that they had not had any grammar courses before, or had had English courses which were inadequate for their needs, and these students

2. Why do students take English? (continued)

felt that taking ENGL 110 would fill a gap in their education. Some students indicated they were taking ENGL 110 as a "confidence-building" course, prior to beginning an English program. A few students wrote that they were intrigued with working on a CAI delivery system. The Opinionnaire and tally sheets may be found in Appendix G.

It is clear that English 110 is seen by many students as a useful and necessary course. An understanding of the "why's" students are taking the course may be useful in demonstrating its value in the curriculum. Counselors and faculty advisors should be apprised of the reasons students elect to take ENGL 110, as well as the kinds of students enrolled in 110, in order to assist in appropriate advisement.

Prepared by P. Rodgers

3. What is the completion rate in ENGL 110?

Completion data for Fall, Winter, and Spring is shown in the table below:

TABLE 12
COMPLETION DATA FOR ENGL 110
TICCIT
1977-78

	Fall 1977		Winter 1978		Spring 1978	
GRADE	No.	Per Cent	No.	Per Cent	No.	Per Cent
A	34	34	41	29.7	33	28
B	2	2	4	2.9	5	4
C	0	0	10	7.2	4	3
D	0	0	2	1.4	0	0
*F	5	5	7	5.0	18	15
W	11	11	25	18.1	21	18
I	12	12	10	7.2	11	9
X	3	3	1	.7	4	3
R	32	32	38	27.5	22	19
	100	100%	138	99.7%	118	99%

*The procedure for assigning the F grade was determined by English faculty grading policies.

4. How many students who received R's did re-enroll and subsequently complete the work?

Data for three quarters (Fall, Winter, Spring) were analyzed, and four categories of R students were defined.

1. Students who earned an R in the Fall or Winter Quarter and have not re-enrolled. (27)

2. Students who earned an R in the Fall or Winter and successfully completed the course by the end of Spring Quarter. (17)

3. Students who earned an R in the Fall or Winter and in a subsequent quarter received an F (3) or a W (7). (The F grade policy was established by the English faculty and implemented in the Winter Quarter.)

4. Students who received an R in the Spring Quarter (17) for whom no follow-up data can be included at this point.

It is recommended that the R grade and eventual completion rate continue to be studied.

5. How do students feel about English, computer-assisted instruction, and specifically, ENGL 110?

Students were asked to respond to the same questionnaire used in the course in 1976-77. The instrument is a modified version of the Student Attitude Survey used by ETS (Educational Testing Service) in its formal evaluation of TICCIT in 1975-76.

Table 13 shows a comparison of student responses in 1976-77 and in the current year, 1977-78. The results in Part I are shown as means; in Part II as whole numbers of responses. An examination of the items shows some increase in positive attitudes.

The TICCIT Review Committee does not recommend further administration of this particular instrument.

TABLE 13

Student Attitudinal Survey, English 110

Part I: Comparison of Responses, 1976-77 and 1977-78 (by means)

NAME _____ Quarter _____

Section: _____

Section I Items 1-36

Directions: For the following statements, circle the number that represents the response closest to your opinion.

SA (5) = Strongly Agree. You strongly agree with the statement or feel that it is true almost all of the time, as it applies to this course or TICCIT.

A (4) = Agree. You agree more than you disagree with the statement or feel that it is true most of the time, as it applies to this course or TICCIT.

NS (3) = Not Sure. You simply are not sure despite opinions on the statement.

D (2) = Disagree. You disagree more than you agree with the statement or feel that it is false most of the time as it applies to this course or TICCIT.

SD (1) = Strongly Disagree. You strongly disagree with the statement or feel that it is false in almost all cases as it applies to this course or TICCIT.

		N=46 1976-77	N=149 1977-78
1.	In this course I felt free to ask questions	4.33	7.69
2.	Using TICCIT allowed me to set a pace that was right for my ability	4.58	4.55
3.	I received a lot of individual attention from the instructor in this course	3.53	4.02
4.	The instructor seemed genuinely concerned with my progress . .	3.85	4.52
5.	Through TICCIT I became actively involved in my own learning .	4.26	4.40
6.	This mode of instruction met my own particular needs	3.95	4.10
7.	I didn't understand how to use "MAP" to guide my learning in this course	2.17	1.80
8.	TICCIT's comments on my work ("ADVICE") helped me in learning rules and concepts in grammar	3.65	3.81
9.	Doing practice questions ("PRACTICE") helped me in learning rules and concepts in grammar	4.26	4.43
10.	TICCIT "HELP" provided clear explanations when the material was difficult to understand	4.11	4.14
11.	The rule statements ("RULE") on TICCIT made concepts in grammar easy to learn	4.08	4.35
12.	Taking tests in this course let me know whether or not I really understood the material	3.78	4.27

TABLE 13(Continued)
Part I (by means)

SECTION II Items 37-44	N=46 76-77	N=149 77-78
Directions: For each question circle the response number closest to your opinion of this course or TICCIT.		
37. Time passed quickly while I was in class.	4.24	3.94
5 Almost Always 4 Frequently 3 Not Sure 2 Occasionally 1 Almost Never		
38. The mechanics of using the terminal distracted me from learning.	2.12	2.18
5 Almost Always 4 Frequently 3 Not Sure 2 Occasionally 1 Almost Never		
39. I just tried to finish the lessons rather than learn the material.	2.14	4.10
5 Almost Always 4 Frequently 3 Not Sure 2 Occasionally 1 Almost Never		
40. I wanted a textbook for this course to use as a reference at home.	3.28	2.81
5 Almost Always 4 Frequently 3 Not Sure 2 Occasionally 1 Almost Never		
41. I wanted information that would tell me where I stood in comparison to other students.	2.21	2.30
5 Almost Always 4 Frequently 3 Not Sure 2 Occasionally 1 Almost Never		
42. For me, the pace at which I had to cover the material in order to finish the course was:	2.73	2.71
5 Very Slow 4 Somewhat Slow 3 About Right 2 Somewhat Fast 1 Very Fast		
43. For my preparation and ability, most of the work in this course was:	3.00	2.84
5 Very Difficult 4 Somewhat Difficult 3 About Right 2 Somewhat Easy 1 Very Easy		
44. The work load for this course, in relation to other courses of equal credit, was:	3.40	2.75
5 Much Lighter 4 Lighter 3 About the Same 2 Heavier 1 Much Heavier		
50. During this Quarter about how often did you:		
3. Quite often. 2. Occasionally. 1. Almost never.		
a) meet with an instructor or proctor outside of class, to discuss your classwork or anything else related to this course?	1.48	1.48
b) meet with an instructor for this course to discuss personal or academic matters NOT specifically related to the course?	1.24	1.29
c) discuss questions related to the course with fellow students?	1.43	1.50
d) seek the help of a tutor for this course?	1.36	1.33
e) use library resources or the learning skills center in connection with your work in this course?	1.14	1.28
f) want to use the TICCIT system when it wasn't available?	2.05	1.64

TABLE 13 (Continued)
Student Attitudinal Survey, English 110
Part II: Comparison of Responses, 1976-77 and 1977-78 (in whole numbers)

SECTION III Items 45-53

Directions: Please check the response which reflects your opinions for questions 45 - 49. Then circle the number that best represents your activities for this course in question 50 a-f and complete the blanks for the last question.

45. Why did you take English 110? (You may check more than one)

		1976-77	1977-78
☐	I wanted a grammar course.	35	90
☐	I was looking for an elective.	8	26
☐	I could not get the English course I had planned to take.	3	24
☐	A counselor/advisor recommended the course.	8	56

	1976-77		1977-78	
	Y	N	Y	N
46. When you finish this course, do you plan to take any more courses in English?				
Yes _____ No _____	30	4	118	31
47. At the beginning of this term, did you plan to take more English courses than this one?				
Yes _____ No _____	25	15	104	43
48. Has your experience in this course:				
_____ encouraged you to take further courses in English?	23		86	
_____ discouraged you about taking further courses in English?	2		39	
_____ had no effect on your plans for further courses in English?	17		24	
51. Approximately how many hours per week did you spend working on the TICCIT system for this course?	Hours/week: 5.91		5.73	

Table 13 (Continued)
Part I (by means)

		N=46 1976-77	N=149 1977-78
13.	I feel better qualified to analyze English sentences. . . .	3.84	4.04
14.	In this course I felt responsible for my own learning.. . .	4.63	4.32
15.	Breakdowns of the computer system disrupted my learning . .	3.31	2.59
16.	I learned a lot about grammar in this course.	4.08	4.23
17.	I feel the knowledge of grammatical terms will be useful to me in other English courses.	4.31	4.47
18.	Other students in this section seemed to like the course. .	3.28	3.74
19.	In this course I felt challenged to do my best work	3.84	4.02
20.	I was satisfied with my personal progress in this course. .	3.93	4.16
21.	The method of instruction for this course was too impersonal for me	2.77	3.34
22.	I feel that what I've learned in this course will be useful in other courses	4.15	4.20
23.	I would recommend this course with TICCIT to my friends . .	3.93	4.23
24.	I would take another course that uses TICCIT.	3.91	3.87
25.	I think I've become a better reader in this course.	3.13	3.46
26.	The instructions for doing practice terms and tests were difficult to read	2.06	2.19
27.	I found the ADVICE messages distracting	2.68	2.63
28.	I do not like the responsibility for my progress that TICCIT places upon me	1.97	2.20
29.	I think that what I've learned will make me a better writer	3.78	3.75
30.	It bothered me not to have much contact with other students	2.06	2.41
31.	I used "HELP" in learning the rules and preparing for the tests	3.68	3.89
32.	I used "ADVICE" in learning the rules and preparing for the tests	3.52	3.61
33.	I reviewed each test that I failed to prepare for taking it again	3.95	3.87
34.	I reviewed previous lessons in learning the rules in the lessons I worked on	4.04	3.50

	76-77	77-78
35. I would have preferred another type of instruction in grammar -- such as classroom lecture and discussion or a workbook . . .	2.74	2.97
36. My writing will be better because of what I've learned about grammar	3.77	3.80

6. Is there any measurable achievement gain?

During the Spring Quarter, 1978, the English 110 Committee devised and pilot-tested a pre- and post-test to all students enrolled in TICCIT English. All students were given the pre-test during the first week of class; only students who earned a grade of C, B, or A were given the post-test. The test has been evaluated, and some revisions are planned prior to readministering the test in the Fall Quarter. No data is recorded here because of problems in administration.

It is recommended by the TICCIT Review Committee that pre- and post-tests be developed by the English faculty and be administered during the 1978-79 academic year.

COURSE DEVELOPMENT

COURSE DEVELOPMENT

Extensive work has been carried out in English and in Math course materials. A smaller unit, an instructional segment in Fire Science, was also produced.

ENGLISH

An essential introductory overview TICCIT English unit (future Unit 8), consisting of 8 segments contained in 3 lessons, and entirely new in concept and content, has been completed this year and is ready for addition to the present English 110 course for on-line instruction in the 1978 Fall Quarter. The next unit in the sequence, on parts of speech (future Unit 7, to be substituted for present Unit 13, and consisting of 18 segments contained in 5 lessons), is substantially completed, although it still needs additional review and the writing of some more practice items and tests. This unit should be completed and incorporated into ENGL 110 in the fall.

In addition to writing and revising, the following two time-consuming but pedagogically sound decisions were made and implemented:

a) the institution of different items in the EXAMPLE and PRACTICE modes, so that students cannot memorize the answers from seeing the EXAMPLES and hence get genuine drill in the PRACTICES:

b) the institution of fixed-length tests, which allow the students to complete a test, regardless of the sequence or number of mistakes made, without being taken off the test after a small number of questions, as is possible by the present testing system.

While the amount of completed courseware has been somewhat less than that projected in the plan submitted to the TICCIT Review Committee in March,

the English authors feel that this has been a very productive year for English authoring. At present, 25% of the originally projected rewriting and revision for ENGL 110 has been completed.

This year substantial time was spent by TICCIT authors making contacts with granting agencies, writing two grant proposals, and helping with a third. A considerable amount of time was also spent on developing management procedures for TICCIT 110 instruction, on work with the TICCIT English 110 Committee to orient other faculty members, and on exchanges of information with TICCIT English proctors, all activities pertinent to the design and writing of TICCIT English. Additional duties included preparation of English pre and post tests. Two of the English authors have taught TICCIT English courses this year.

Source: M. Liu

TICCIT ENGLISH PROGRESS CHART

1976-77 THROUGH 1977-78

FIVE-YEAR TICCIT ENGLISH PLAN, 1977-82

ACADEMIC YEAR	AUTHORS (in FTE)	NEW OR REWRITTEN ENGLISH MATERIAL intended for:	Contents:	OTHER PRINCIPAL ACTIVITIES
1976-77	1.3	ENGL 110	Unit 7 (18 segments)	principal author received 6 weeks' training; in-depth familiarization of authors with present courseware; drafting of detailed English 110 revision plan; some grant development by 1 part-time author
1977-78	1.7	ENGL 110	Unit 8 (8 segments) Unit 7 (approx. 800 added test and practice items)	preparation of 2 grant proposals & assistance with 1 proposal; development of course management procedures for ENGL 110 instruction in coordination with other instructors; activities related to on-line integration of new units with old & as yet unreplaced ENGL 110 units

FIGURE 2

MATH

Extensive revision of MATH 06 TICCIT materials was carried out during the 1977-78 academic year.

During the Fall Quarter 1977, one Math faculty member on one-fifth released time, reviewed MATH Unit 23, Lesson 2, and began revision of MATH Unit 17. During Winter and Spring Quarters, 1978, one Math faculty member was released full-time to TICCIT and two Math faculty members were each given two-thirds release time for TICCIT courseware development.

Their goals for that period were as follows:

1. Revise MATH Unit 23, lesson 2
2. Revise MATH 17 completely (five lessons)
3. Revise MATH 16 completely (three lessons)

The revisions were completed by the end of Spring Quarter, with simultaneous review by Math faculty.

In addition to the revision, a complete analysis of 06 and 07 TICCIT Math materials was carried out. Of the 67 TICCIT Math lessons originally developed at Brigham Young University, 30 are in use currently, equally divided among MATH 06 and 07. Thirteen of the 15 lessons in MATH 06 and three of the 15 lessons in MATH 07 have been completely revised, reviewed, and accepted for the Developmental Math classes.

Long term goals are:

1. Revision of the remaining units in 06 and 07
2. Review and revision of the balance of the Math courseware for adjunctive use, not only in Math but in other disciplines such as business, social sciences, physical sciences, and philosophy.

Figure 3 shows the progress in revision of MATH courseware and the use being made of the lessons.

Source: Division of Natural Sciences and Mathematics

TICCIT MATH COURSEWARE DEVELOPMENT CHART

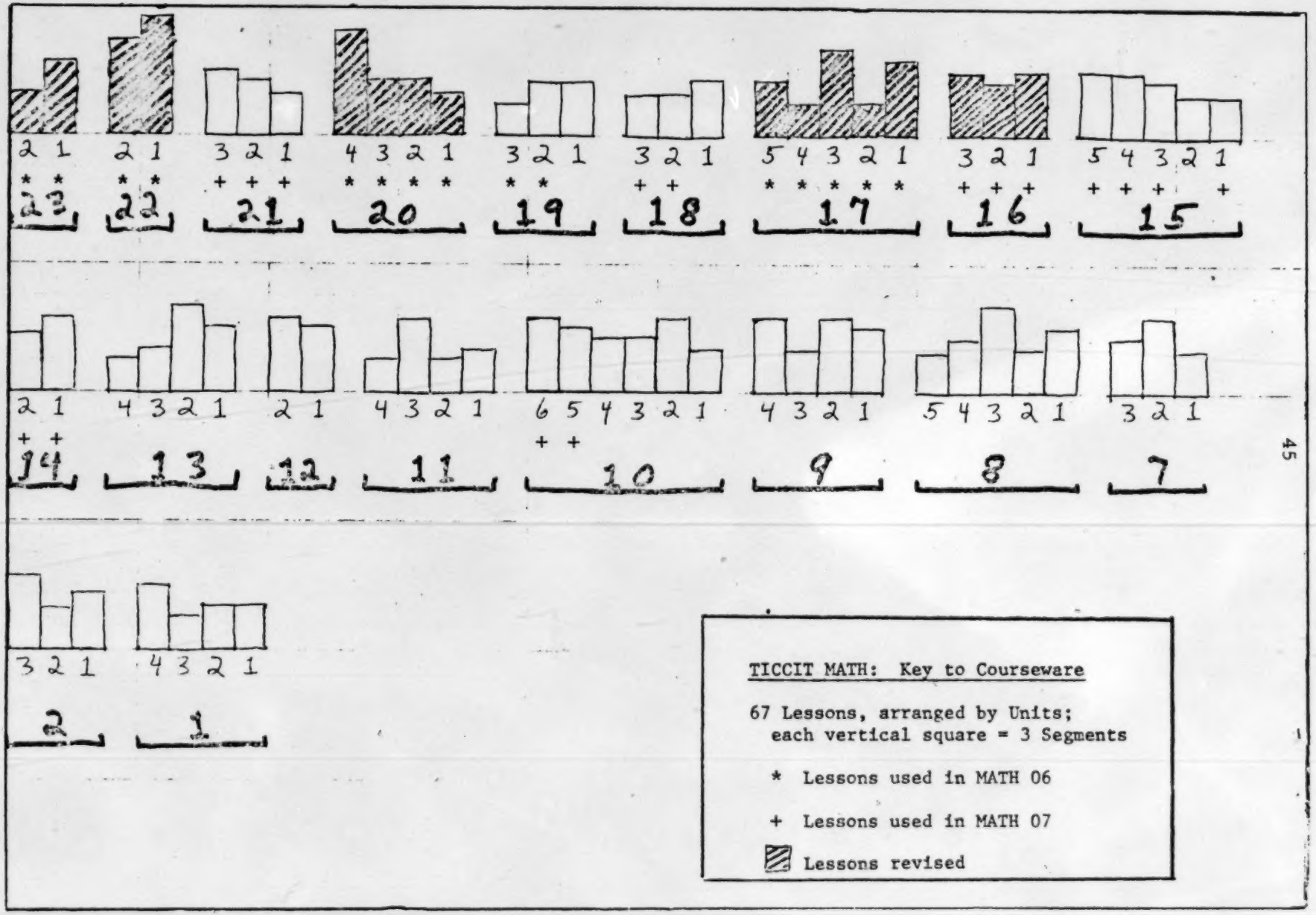

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FIGURE 3

FIRE SCIENCE LESSON

At the request of Mr. Bob Smith, Program Head of Fire Sciences, AN, a student in the Fire Science Program was assigned to explore the feasibility of producing instructional segments on the TICCIT system to augment that curriculum. Mr. Jim Cook was asked to work with the student, Sam Burnetto, in this pilot project.

The Fire Science demonstration material consists of six segments presenting introductory hydraulics with concomitant mathematics. (Roughly 1/2 chapter traditional text). These are located in Course 55, Unit 5, Lesson 1 of TICCIT. Each segment has a rule and several example and practice items.

The method of producing material was to have the author (Mr. Sam Burnetto) break down the chapter into discrete concepts and then develop rules with example and practice items. He wrote these on a grid sheet that corresponds to the terminal screen. The IDT (Jim Cook) then "input" the rules, broke the sample and example items into the various files, and wrote and input the program and files to put them back together. This method proved to be satisfactory.

Members of the Fire Science Faculty examined the material and found the method of delivery satisfactory, and that the instructional material, with minor revision, would be useful and effective. They are interested in expanding the material and offering it to students. They have been referred to the TICCIT review team.

The material produced is unsophisticated and limited (vis-a-vis using the system). This was due directly to the time and work constraints on both the author and IDT. The author spent 30 hours and the IDT 20 hours in producing the material from start to finish.

Source: J. Cook

SYSTEM ADMINISTRATION:

TICCIT MANAGEMENT

A TICCIT Review Committee, chaired by Dr. Jean Netherton, was established in November 1977. The committee was designed to function both as overall management review and as curricular monitor.

TICCIT currently involves operational and instructional support (LRC), multi-discipline authoring and curricular design (instructional divisions), instruction (divisions), planning for future course development and allocation of resources (Provost's staff), and evaluation of the educational effectiveness of CAI (dispersed responsibilities).

Some of the tasks relating to TICCIT administration and operation during the year are:

a) Training new authors

b) Training new staff personnel

c) Training and orienting new TICCIT instructors

d) Providing public relations information about TICCIT

e) Scheduling and providing TICCIT demonstrations to visiting individuals and groups

f) Collecting data

g) Evaluating and analyzing data

h) Preparing reports

i) Seeking funding sources and writing grants

j) Providing review and quality control of new TICCIT courseware

k) Planning and budgeting, an overall view

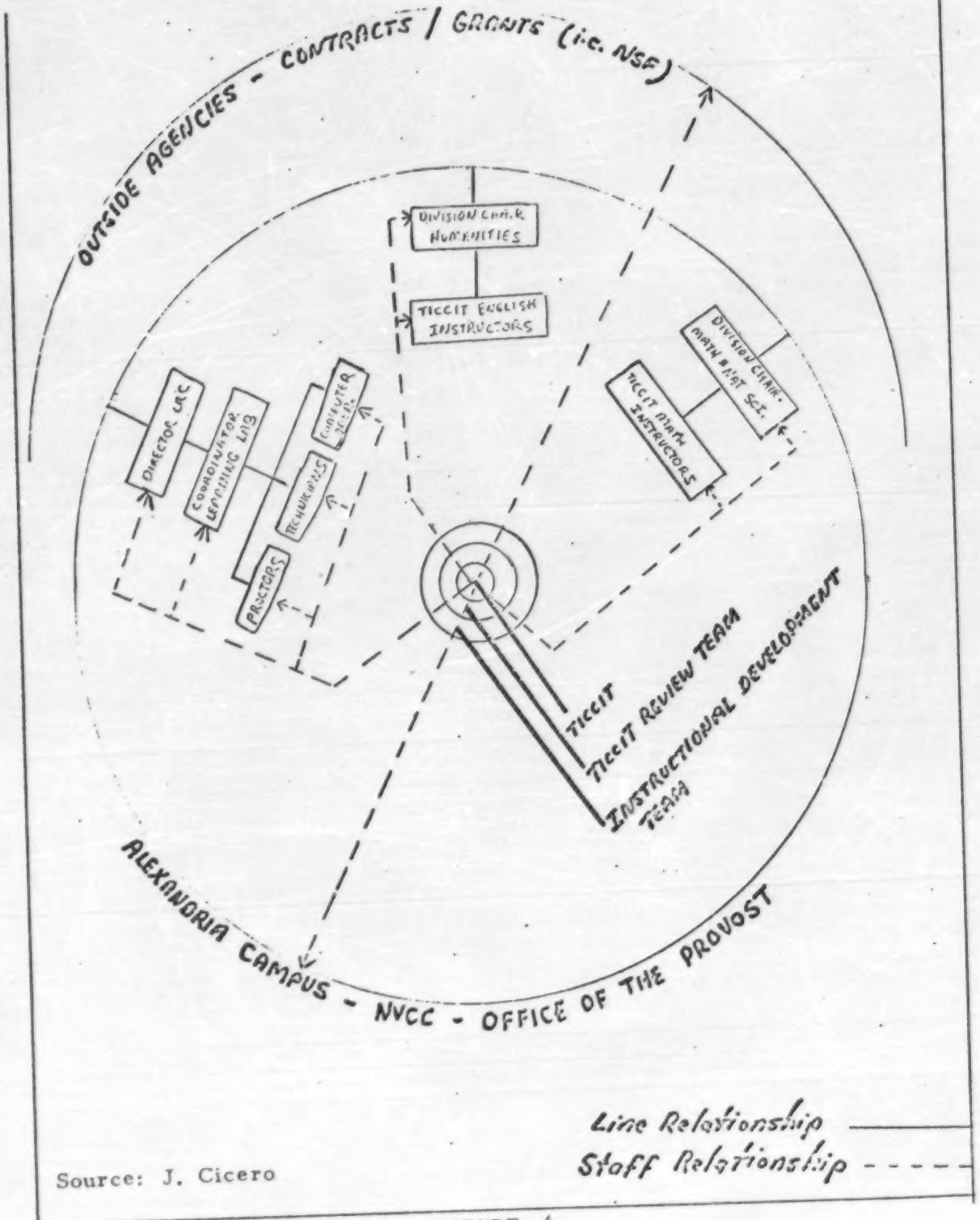
This diverse set of responsibilities and tasks has created multiple management questions during the year. Responsibilities have been assumed on an inter-related cooperative basis, pending the development of a workable management model. Input for developing that model has been solicited and received from all areas involved in TICCIT operations.

Coordination of authoring and related instructional development technical support has been perceived as an instructional area responsibility. For 1977-78, a coordinating committee for this activity was developed. Ms. Barbara Wyles, who had partial release time for TICCIT authoring, served as Team Chairman and as a member of the TICCIT Review Committee. The primary responsibilities of the Team Chairman were to call regular meetings of authors and instructional development technicians, to serve as Team Leader to organize that group for the most efficient use of time and personnel, and to provide progress reports to the TICCIT Review Committee.

A mid-year organizational design was developed, showing the complex multiple relationships of TICCIT operational, instructional, and development functions. (Figure 4)

The management design for TICCIT continued to be a focus for the Review Committee during the Spring Quarter. Principal areas of concern were the need to provide communication links among the division authors, and coordination among the multiple groups involved. After weighing a number of possible designs, the application of the campus Instructional Development model to TICCIT, combined with coordinating meetings led by a member of the TICCIT Review Committee, was selected as the management model for 1978-79. Regular progress reports from each instructional development curriculum area will be requested. Figures 5, 6 and 7 show the structure and reporting format.

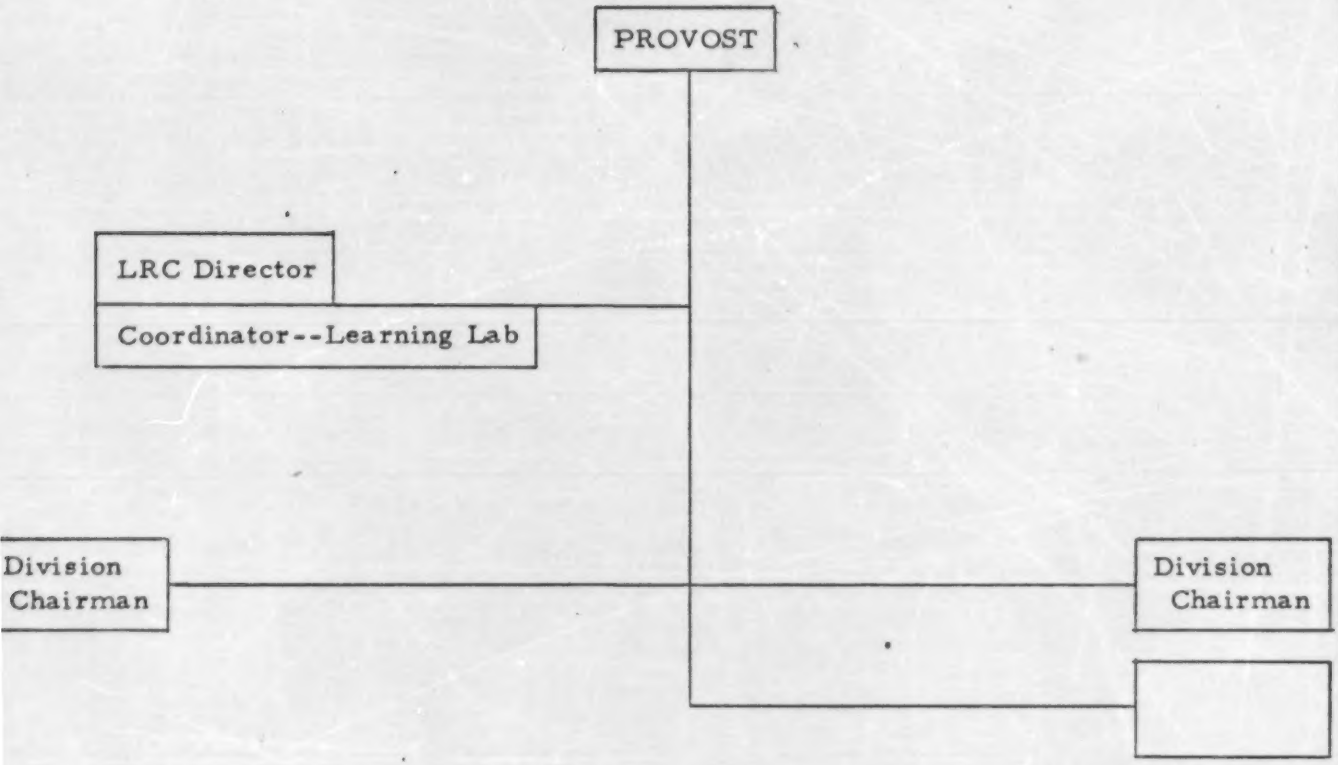
MULTIPLE RELATIONSHIPS IN TICCIT
OPERATIONAL FUNCTIONS



Source: J. Cicero

FIGURE 4

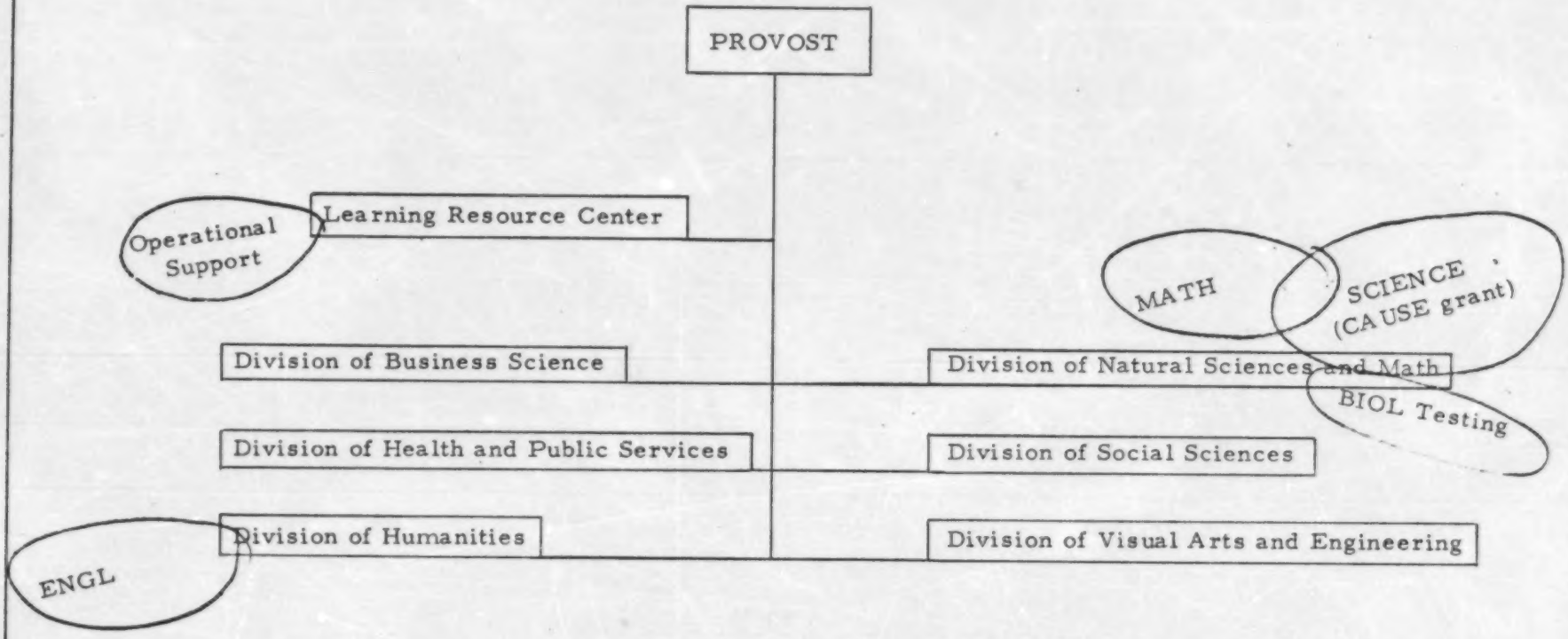
CAMPUS TICCIT REVIEW COMMITTEE



Campus TICCIT Review Committee receives progress reports, determines priorities, adjudicates when necessary, reviews equipment needs, plans and budgets for future.

FIGURE 5

INSTRUCTIONAL DEVELOPMENT (TICCIT)



Each instructional development area has a team leader and a review team (content specialists and objective analyst)

Each instructional development team provides semi-monthly progress reports to Division Chairman

FIGURE 6

TICCIT INSTRUCTIONAL DEVELOPMENT

Progress Report

Date_____

Curriculum Area_____

TICCIT Address_____

Team Leader _____

Authors_____

IDT Support_____

*Status

Problems

Comments

*Status should include content development and review

Copies to: Division Chairman
Campus TICCIT Review Committee

FIGURE 7

CONCLUSION AND RECOMMENDATIONS

CONCLUSION

Mainline instruction by computer can work. The process of making instruction visible requires intellectual conviction as well as the technical skills of ordering and sequencing content in the appropriate modes. Authoring skills can be learned and applied. Faculty involvement in reviewing instructional material of colleagues can be stimulated, and faculty acceptance of that material as course instruction can be achieved. Students will select CAI as an instructional delivery system and, as shown in this year's report, will re-enroll and remain under instruction at a rate higher than in the corresponding lecture mode. (Table 8)

The complexities of introducing a large scale CAI system into the instructional mainstream cannot be underestimated or minimized. When instruction becomes visible and when the course content is shared in detail among faculty and students, new attitudes, new postures, and new techniques are developed. The process is one of gradual assimilation, over a period of time. New procedures and new instructional styles cannot be mandated overnight; they must be rooted in a firm basis of mutual understanding in order to flourish. The expansion of the CAI system for adjunctive use in various disciplines adds additional dimensions to instruction, and in turn, impacts upon the instructional style.

A CAI system lends itself to careful assessment and detailed analysis. Data become readily available, questions are posed, and frequently, the answers suggest new questions.

This study has compiled the questions raised during the course of the year, and has attempted to review answers, development, and administration. We find that some questions have been answered sufficiently, that others should continue to be asked and that some may be unanswerable, except through long range follow-up studies.

RECOMMENDATIONS

Six areas have been identified for further study. These areas are:

1. The increasing adjunctive use of TICCIT should be reviewed, with a system for formal data collection and reports.
2. The completion rate of students receiving R grades should continue to be studied.
3. Pre and post tests (achievement) should be developed and administered in English and Math courses taught on TICCIT.
4. A study should be conducted to test the following null hypothesis:

   > There is no difference in the performance of TICCIT course students compared with lecture course students as they continue the study of Mathematics at NVCC.

5. The factors involved in selection of the MATH instructional mode should continue to be studied.
6. Late-entry populations should be identified and studied as a separate sub-group in reporting completion rates.

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